# Q U A N T A

## T H E   N E W S L E T T E R   O F

## T H E   I N D E P E N D E N T   Q L   U S E R S '   G R O U P

VOLUME 1 ISSUE 3

APRIL 1984

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## INFORMATION ON THE GROUP

Membership of the Group is by subscription to the Newsletter, which is published monthly. Membership details are obtainable from the Group Secretary. Membership of the Group is open to anyone with an interest in the Sinclair QL microcomputer.

Members requiring assistance with problems related to the QL may call the Secretary. An attempt will be made to put them in touch with a member who can help with the problem.

Workshops will be arranged from time to time in various parts of the country.

A membership list is obtainable from the Secretary.

Please send all contributions for the Newsletter to the Editor.

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and Newsletter Editor:-

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## EDITORIAL

Apart from the one dissenting voice, the majority of embers seem quite satisfied with what we are trying to do.

Please have a look at the queries raised by members in their letters, and see if you can come up with solutions or comments.

As I am writing this (5 April), it looks as though another of Sinclair's predictions, that deliveries would commence before the end of March, has not been fulfilled.
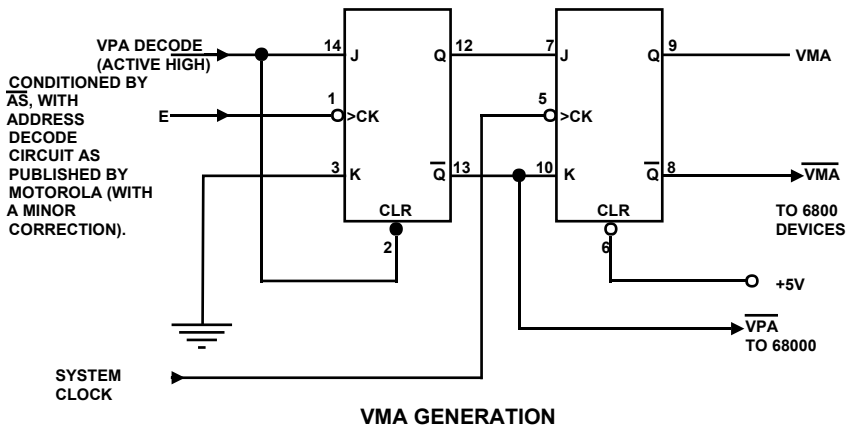
You should by now have received notification of the Cambridge workshop. It will be devoted to 68000/68008 assembly language, and I will be showing off my 68008 system being used in conjunction with one of my TRS-80s for 68000/68008 software development. Probably the nearest any of us will get to a real QL for some time!

I am still awaiting a reply from Mr. Searle to my letter reproduced in the last issue, enquiring about the reason for the production delays! I have written to Sinclair asking if they would have any objection to our publishing a disassembly of the ROMs, when we get a machine to "disassemble". I have told them that we do not intend to reproduce their object code, just a translation of the object code into assembly language. This should get over any objection they might have on copyright grounds. I hope I get a reply to that letter!

It looks as though the best way to order a QL is on a credit card. Sinclair cannot get your account debited until they ship the machine, and you have some redress against the credit card company, if, for some reason, something goes wrong.

Leon Heller

**LS73**



**VMA GENERATION**

L.F.H

## MEMBERS' LETTERS

IQLUG is the first organisation of its type that I have ever joined, and having received my first newsletter I feel that I must comment on the contents and on what I expect the Group to be able to do for me.

First, the editorial. I must say that I found this both tedious and irritating. It seemed that the sole purpose was to fill two pages of the newsletter regardless of the content. Specifically, I would draw your attention to three aspects.

1.    The continual reference to "friends" who just happen to be involved in the business or to have visited companies concerned. If these friends exist let us have specific information and not the veiled references to what "they" think may happen.

2.    Before commenting on what has or has not happened I hope you will try and understand the mechanics of electronics production. As one who is involved in the industry, albeit not with computer manufacturer, I can assure you that the late arrival of a test jig is commonplace and does not mean that manufacture has not started. Manufacture can continue without test jigs and even the testing itself can be successfully carried out even if it does take longer and cost more.

3.    Whilst you are quite right in saying that the ASA has no legal powers, your suggestion of what Sinclair may do is quite ludicrous. The ASA can, and does, recommend to publishers that they should not accept advertising from companies who, for one reason or another, are deemed unreliable. Once they have made this recommendation it is unlikely that any reputable magazine would continue to accept advertising from such a company.

In short, in your editorials please keep to the facts and to informed comment, anything else is both insulting to your readers and reflects badly on the Group. By the way, please leave the jokes to the comedians, they are paid for it.

I was a little surprised to see that you had not contacted Sinclair before launching the Group. Surely this was an unwise move as the goodwill of Sinclair is vital if the Group is to achieve anything for its members. I am sure that you will agree that goodwill is obtained by being thoughtful beforehand and not apologetic afterwards.

Not having seen the first newsletter (a copy would be appreciated if possible) I am not aware of the aims etc. of the Group. I hope, and have assumed, that they are solely to inform, advise and assist members in getting the best from their equipment. If this is the case can we have accurate, factual information, advice based on knowledge rather than assumption, and practical help covering all aspects of the use of microcomputers.

I would suggest that you may like to look into the possibility of:-

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I have written to Sinclair regarding the early delivery of manuals. Manuals are available, separately, I am told, for £25 each, to anyone who cares to place an order.

I think it might prove very difficult to ascertain what the software houses are working on, as they would probably not want their bright ideas getting into the hands of their competitors. I don't mind telling everyone that I am working on a 68008 machine code monitor/debugger, however!

Due to mw policy of publishing everything that is sent in, I do not really have any say in the matter of Sinclair "bashing". In my opinion, for what it is worth, a lot of the criticism is quite valid. */

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...I may be a little premature? At the present time we do not own a microcomputer, although it has been suggested that we should purchase one for club use. I originally suggested the BBC 'B', but having seen details of the Sinclair QL am very impressed. Unfortunately, we understand that there have been recent development problems, and possibly membership of IQLUG might afford us some useful feedback. It would certainly be interesting to know the views of users, as well as details of suitable disk drives, etc.

Ivan Esgate,
173 Ramnoth Road,
Wisbech,
Cambs. PE13 2SW

---

...and hope that one of the IQLUG will soon devise some games requiring only the "full-size" replica keyboard on the QL advertising brochure!

Jim Hartley,
24b Marywood Square,
Glasgow G41 2BJ

---

...If the Users' Group is going to be "demand-driven" then how about some of these ideas (some are similar to the interests part of the newsletter).

a)   networking via the LAN socket and modems. Is this possible?

b)   Hardware Groups for:
      i)   interfacing real disks to the QL
      ii)   Centronics port - this is essential! (I don't have a serial printer).
      iii)   General mucking about in the machine to find goodies.

c)   a modem specially for the QL (once you've been on Micronet you're hooked!)

d)   a Smalltalk special interest Group - Byte August 1981 - a concurrent language that takes a REAL computer to run it on, 68000 naturally.

e)    a commercial software library - yes, you are non-profit making, but you have to have some money to run the software library, free advice service and all the other things that you intend to do.

f)    local user group meetings.

I doubt that I've added any original ideas, but if you don't hear from your members (or prospective members), how will you know what they want?

A. McDonald

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...I was incidentally impressed by the first issue of Quanta. The delay in supply is highly frustrating, and made all the more so by the severe lack of information beyond the advertising literature. Is there any authoritative person or persons who can advise on the attachment of peripherals. I have an OKI Centronics compatible printer which I would like to use with the QL when it arrives. Currently Miracle Systems Ltd. are offering a parallel Printer interface for £49.

I appreciate that you will not have the time to respond to individual queries, but if Quanta could something on this I am sure it would interest quite a lot of people.

Campbell Morrison,
10 Sperrin Park,
Omagh,
Co. Tyrone,
N. Ireland BT78 5BA

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I was very interested to see in Practical Computing that you have launched an IQLUG. Congratulations and may it be as useful and helpful as NATGUG. My father and I are both tempted by QLs, and feel that your news and views on it, especially on the all important question of the reliability of the Microdrives, or more especially of the cartridges (I hope they are better than Aculab Floppy Tape wafers) could well be the deciding factor. Presumably address lists (compiled by Electric Pencil) could easily be transferred via RS-232 ports?

Anthony Stamp,
Bonds Cottage,
Wormingford,
Nr. Colchester,
Essex.

/* The Electric Pencil is a word Processor for the TRS-80.

Serial transfer of text files between the TRS-80 and QL should be quite feasible. */

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The first issue of the Newsletter was both interesting and informative, but I have the following suggestions:

1.     Proposed IQLUG constitution:

Nowhere in the proposed constitution does it mention what will constitute a quorum at any of the meetings. Whilst I appreciate that a fixed number might be difficult to assign at this point in time, nevertheless I think that one of two options should be offered.

        i      Either a percentage of the membership should be nominated
OR ii          The number should be decided at the first AGM of the group.

2.     Topics of interest:

I think that probably the most important topic will be that concerned with impending (?) delivery of the QL - how many ordered and when versus how many (to be) delivered and when.

Although you list PSION as a recipient of QUANTA, no mention is made of your rival, QLUB. If this is to be independent of PSION, perhaps copies should be sent.

There might very well be interest in the proposed link between ICL and SINCLAIR. Is there any information on this yet? Again, copies to the appropriate ICL division?

This is a very quick response to the first edition, and should of course be treated as such. As always, the proof of the pudding etc.

Best wishes for the future to all concerned.

D HARBOTTLE
Oakfield House,
Great Lime Road,
Forest Hall,
NEWCASTLE UPON TYNE
NE12 9DH


Thought you might be interested in the enclosed copy of the confirmation of my order from Sinclair. The order was placed on February 18 AFTER receiving confirmation by telephone from one of the salesgirls that Sinclair was actually already delivering machines. I also requested in the letter accompanying my cheque that delivery take place before April 7, as the computer is going to an English address (a stipulation of Sinclair's!) and someone would be able to bring me the computer personally between April 7 and 15. As you can see there is no reference to this request in the confirmation, nor is the English address even referred to! At this point I am trying to decide what to do and am giving serious thought to contacting the Dutch-British Chamber of Commerce and/or cancelling my order. The QL will undoubtedly be a wonderful machine, perhaps even worth the long wait, but Sinclair's deceptive business practices cannot be condoned under any circumstances.

Now for a few questions: What books on the 68000 do you recommend? Why not go ahead and publish the ROM listings (certainly Ian Logan has established a precedent?)? Is there at this time any way of finding out if the QL is going to be capable of alternate character sets (I'm thinking specifically of German characters like ä, ë, ü) for foreign languages and how will this be done? Will it be in ROM or can one get into the character routines and create user-defined characters? If so, will QUILL be able to handle the new characters? Finally, which of the two processors controls the display?

In the meantime, thank you very much for two very fine first issues.

Bruce Cohen
Stadhouderskade 50
NL-1072 AA Amsterdam
Netherlands


Dear Mr Cohen

We are writing to confirm your order for our QL computer. If any of the details shown enclosed - name, address, goods ordered or credit card number, if applicable - are incorrect please let us know immediately by returning this letter showing the changes. If at any time between now and receiving your QL you wish to cancel or make any changes to your order please use this letter to indicate such changes. To avoid any confusion and consequent delays always use this letter to cancel or change your order: please do not telephone us with changes.

If you have applied for QLUB membership, we will be sending your membership card with your QL, and your twelve month period of membership will commence at that time. During your membership you will receive 6 issues of the QL newsletter, the first of which will be sent shortly after your QL.

If you have paid for your QL or QLUB membership by cheque, it has been banked in a Trust Account. Your money is released to Sinclair only. after the QL has been sent to you. If you have paid by credit card your account will not be debited until your QL has been dispatched.

The demand for the QL has been phenomenal from the day we launched it. We expect to be able to deliver your QL not later than the end of July. We realise that the time between now and then will be frustrating, but we are confident that your QL will be worth waiting for and, of course, we will do everything possible to beat our target date for sending it.

Yours sincerely

Nigel Searle
Managing Director

I hate to sound knowing,but surely no one with experience of the British Micro Industry can have supposed that Sinclair would deliver the QL in one month? Of the home industry only ACT seem capable of developing a machine and delivering it on time. Incompetence is the usual reason for the delays, plus overconfidence expressed in inadequate testing of prototype. Some of the latter seems to be involved with Sinclair, since the "Financial Times" reported that they had run into unexpected difficulties,which they refused to specify. But I believe they are also using premature announcement as cheap market research. They now know, at very little cost to anything except their reputation, about how many QL they have to manufacture per month, and their expenses in sending many people's money back will be paid for by the money which doesn't have to be returned. They will now probably start making the thing;if they can get a few into the public's hands by midsummer the parts which don't work should become clear by autumn and be put right in time for the Christmas rush.

This time next year, therefore, the QL will be a splendid computer - and probably obtainable on one month's delivery. You have already identified the two main questions one is asking - how does one connect Epson printers? - and what is the best monitor? A third point is - how does one get existing programmes into the QL when it has no disc or tape access? It seems that simple long-winded Basic programmes will not need all that modifying to run in QL Basic, but has one got to type in every "if then"? It is a real comfort to know that you are out there batting against these no-balls. Keep it up!

R. N. Higinbotham
55 Cleaver Square
London SE11 4EA


Let me tell you my personal experiences with Sinclair Research.

        3rd February: Ordered QL by post enclosing cheque.
        17th February:     Cheque presented and honoured by my bank.
    29th February:     Letter of acknowledgment from   Sinclair
                            estimating a delivery date of end of June.
        5th March:         Cancelled order by post (the only way)
        27th March:         Telephoned Sinclair because of not hearing from
them. The girl who answered said there had been a delay in returning money "Because one of the cheque signatories has been off sick and so all the cheques are having to be sent to head office".

        Is it not true that 1) The QL was launched with a delivery date which was not just optimistic but actually fraudulent?  2) Sir Clive Sinclair has admitted that it is part of their business policy to launch before development has been completed?        3) The "Trust Fund" set up to hold customers' money will benefit no one but Sinclair themselves?    4) The QL saga, as exemplified by the above factual account, is inefficient? bad business? sharp practice? or an old-fashioned rip-off?

Does not Sinclair Research increasingly resemble the Rolls Razor washing machine company? I hope I have had MY money before the bubble bursts.

BOB BRITCHFORD

I Give below some thoughts and comments about the magazine and QL:-

Magazine

I like the broad coverage (including hardware) and do not think you can be expected to do better in view of the absence of the machine. Your type fount is a little hard on my elderly eyes.

Rules

I would like the auditor to be professionally qualified, though this may be too expensive unless you can find a volunteer.

Delivery

I sent my order on 30 January, and Sinclair advise that they hope to deliver by end of June or earlier.

Books

I would like to have details of books (when available) covering the following:-

> 68000 assembly language programming
> disassembly listing etc. for operating system
> similarly for the supplied software
> hardware details including pin assignments
> specifications for interfaces

Printer

I have an ancient 6800 computer, controlling an Epson parallel printer. I propose to connect the QL RS-232C interface to a serial board on the 6800, and use this as a print buffer (and code converter, if necessary). I have two queries:-

> a) can I get handshake by echo?
> b) is there any serious limitation on cable length (I intend to use twin-screened cable)?

A further idea is that I might use this arrangement to provide a cassette interface for the QL. The 6800 runs two cassette recorders, each with motor control. This would give mass storage back-up.

Queries

I assume that the 68000 and 68008 are identical for assembly language programming, apart from the additional machine cycles required to access a word in two bytes with only an eight-bit data bus.

Your Issue 1 (page 18) refers to BCD arithmetic, but I have not been able to find any instruction corresponding to the 6800's DAA and there is no half-carry flag in the status register. Your Issue 1 (page 16) states that there are four levels of interrupt, but Issue 2 (page 18) suggests that there are seven levels (as for the 68000). Incidentally, you say that level 0 means that no interrupts are pending, but I think that you mean to say that interrupt requests are not allowed.

I hope that some at least of these points will be dealt with in subsequent issues of Quanta. Incidentally, I have one more query, that was for the circuitry for deriving the VMA signal for use with 6800 peripheral chips.

L. C. H.

/* Professional auditing of the accounts will not be expensive, if we use a local firm, as they will audit only. Brian Pain will prepare the accounts for audit.

Your proposal to use the old 6800 system for printing and bulk storage is very like an idea of mine to use mw old TRS-80 Model I for a similar purpose. I will even be able to use the disk drives on the TRS-80, via the RS-232 port, until I build a disk interface for the QL.

I do not think that the standard QL RS-232 interface will Support handshake by echo. It might be possible to alter the driver software. Time will tell.

There should be no real limitation on the cable length, provided the serial transmission rate is kept fairly low. The distance is dependent upon the transmission rate, amongst other things such as the cable transmission characteristics.

The 68000 does have a similar instruction to the 6800 DAA. It is ABCD, Add Decimal with Extend. The C and X condition codes are set if a decimal carry is Generated, and cleared otherwise.

The 68008, like the 68000, has a three bit interrupt mask, but only two pins to encode the seven levels of interrupt. It therefore only encodes values of 0, 2, 5 and 7. Level zero is used to indicate that there are no interrupts pending, and level seven is a non-maskable edge-triggered interrupt. I am currently experimenting with interrupt handling on my 68008 system. and will write up my findings for the newsletter. */

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...I have ordered a QL, and if it lives up to the claims made of it so far, it should certainly be an impressive machine. My particular areas of interest concern potential business applications - I am a Chartered Company Secretary involved in the Lloyds underwriting market - and the uses it can be put to with regard to the Geology-based degree I am studying for with the Open University.

I look forward to receiving a copy of the Group's newsletter and trust that none of us will be disappointed with the QL - when it finally arrives!

Colin Payne,
55 Stoneleigh Road,
Clayhall,
Ilford,
Essex.

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I am hoping to obtain my QL some time before the end of June. I know it seems a long time to wait, but perhaps in the meantime by joining a Users' Group I would derive great benefit from those lucky people who may obtain their QLs earlier than me.

I thought £38 was rather steep a subscription to QLUB. and as yours is an independent non-profit making group I feel it far more fitting to join.

I am also a radio amateur. Call Sign G3YWH, and feel that the QL may have some interesting applications in RTTY communication via the telephone line and satellite reception, weather forecasting, Russian TV reception etc., because of the multi-tasking facilities.

Frank Hill,
24 Mount St James,
Blackburn,
Lancs. BB1 2DR.

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You may recall that I have been a member of NATGUG for about three years now, and have every intention of continuing my membership. I have seen in the newsletter and magazines that you are starting IQLUG, and I would like to become a member.

I have never purchased anything through mail-order and therefore have not ordered a QL. but could change the convictions of a lifetime with the confidence that independent experience and knowledge obtained from a club run on lines similar to NATGUG could provide.

Noel D Craker,
27 Kelvin Crescent,
Harrow Weald,
Harrow,
Middx. HA3 6DP.

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Perhaps the Group ought to be re-titled IQLOG - Independent QL Ordered Group!

To say that you have managed to produce two informative and interesting newsletters, based on a non-existent computer is, to say the least, most remarkable. Congratulations to Leon Heller and yourself! Your efforts are appreciated.

As with other members, a detailed exploration of monitors and printers is of considerable interest. Please also consider typewriter/printers and Portable TV/monitors, as these offer greater flexibility.

Because of the concern expressed by some potential QL owners on the efficiency of the Microdrives, there seems to be a very good argument to focus attention on the ROM cartridge input. I have paid up to £30 for a 4K video game for the Philips VideoPak system - so can some manufacturers offer better value for money than that?

In the Sinclair specification, there is no mention of a TV/monitor lead either provided or to order. Why? Are the parts standard?

If. in your busy schedule, you could review some of the monthly magazines which appear to be preparing for the QL User, it would be helpful. For example, "Your Spectrum" intends to germinate a QL User from its centre pages later this year.

Although not every subscriber will write to you. I feel sure that we applaud your fine efforts to date and look forward to a change from a trial subscription into something more permanent.

Michael M Lindley,
13 Lynton Avenue,
Thorpe,
Wakefield,
West Yorks. WF3 3DF.

I would like to Join IQLUG...

I am not abandoning my Model 4 at all - it is a Great computer - but I do want to put croquet onto the computer sometime, and I think that would be easier in colour. The problem is distinguishing four different balls in monochrome, even with the very high resolution of the Model 4. The Model 4 hi-res board is still not available, and the QL, for an extra £200, does offer quite a bit more. In other words, I think it would make a useful games companion to the Model 4 when, eventually, it reaches the market.

I Howard Wright.
17 Greygoran,
Sauchie,
Clackmannanshire,
FK10 3ET.

## SWINDON WORKSHOP

I was very impressed with the lectures on the QL which Leon Heller gave at Swindon on Saturday. The lectures were very informative and the presentation was greatly enhanced by Leon's obvious enthusiasm for the subject. As a result, I am now even more eagerly awaiting the arrival of my QL.

I also look forward to the next    IQLUG meeting, and hopefully by then there should be some QLs in existence.

Malcolm Newport,
26 Botany Road,
Walsall,
West Midlands WS5 4NE.

## TWO NEW PUBLICATIONS CALLED "QL USER"!

"Your Spectrum", published by Sportscene Specialist Press Ltd., will have a supplement called "QL User".

EMAP Business and Computer Publications Ltd. have launched "QL User", with Peter Rodwell (formerly Editor of PCW) as Editor. I wonder which publication will back down first?

Leon Heller

## CP/M68K

At least two members, including myself, are interested in putting CP/M68K on the QL. At least one disk drive will be needed, and things might be a bit tight with only 128K, but it would enable us to set a C compiler up and running very quickly. A BIOS (Basic Input/Output System) will have to be written in 68000 assembler, but this should not take more than a few days. The cost of CP/M68K is around £250. Not exactly cheap, but you do get the C compiler thrown in, and a 68000 assembler. The compiler does not support floating point, unfortunately. If anyone else is interested in this project could they get in touch with me, and I might buy the documentation, to see what is involved.

Leon Heller

## THOUGHTS ON THE QL WINCHESTER HARD DISK

Assuming that the disk capacity is 5 Mb, then 50 Microdrive cartridges will be needed to back up the whole 5 Mb! At a cost of £4.95 each, I make that £247.50 in total! In fact, for business purposes, it is advisable to have three sets of backup media, used in rotation. Things start to look a bit silly, don't they.

It is to be hoped that the Winchester will have a separate removable hard disk. In conjunction with the 500K RAM expansion for buffering, backup should be extremely fast. This will increase the cost considerably, however.

Leon Heller

At present I operate a 48K Spectrum, using the Hilderbay Interface with a Juki 6100 daisy-wheel printer, mainly for word-processing and spread-sheet work so that "graphics" are not of much importance to me.

Will the Hilderbay/Juki equipment be suitable for the Sinclair QL jointly or will only the printer be of use?

P. J. Foord
Combe Cottage,
Bakers Wood,
Denham,
Uxbridge, UB9 4LF.

# - 15 -

Micro - PROLOG

by

FRANCIS CAMERON

It may seem a bit previous to be writing about micro-PROLOG for IQLUG - but the fact that we're all subscribers places us in the category of happy-go-lucky optimists who fondly expect the best to happen. Even if it takes time! So here goes.

PROLOG means PROgramming in L0Gic. It's a high level language intended as a harbinger of those fifth generation computers that will recognise standard English as a means of everyday communication. The Spectrum version is already about. In fact if you'd read the small print in the Sinclair ads last December you'd have seen it announced as "coming soon"; so it was quite a surprise - a big bonus surprise - to find it on sale at the Ally Pally fair a full three weeks before Christmas. It comes in a handsome package and at a handsome price: £24.45, no less. And for this you get a cassette with standard micro-PROLOG an one side and SIMPLE on the other; a 24-page introductory booklet, and 301 pages of micro-PROLOG Primer written by Clark, McCabe & Ennals under the copyright banner of Logic Programming Associates Ltd. who do versions for various other machines such as the 380Z and the Apple II. I was glad I bought Ennals' "Beginning micro-PROLOG" from Watford Technical Books at the fair because this is such more user-friendly than the official Primer: though the syntax is minimally different. I read Ennals in the train on the way back to Oxford and was quite taken with it. The Primer is a much tougher nut to crack (and strangely enough it appears to form a substantial part of Prentice-Hall's "micro-PROLOG" which came out in January. (At least that's the impression I got from going through the P-H version on display at Blackwell's.)) (Yes: two brackets are intended. Read on and you'll see what inspires them!)

micro-PROLOG - always spelt with with a small m, even at the beginning of sentences - programs with a fascination akin to that engendered by one's first fumbling steps in BASIC. And, like BASIC, it has its standard mythology.

You begin by learning to compile mini-databases. (They have to be mini. There's not such room left by the time you've loaded PROLOG plus its SIMPLE front end which is there to make things easier. So you will probably:

&. add (John likes Mary)
&. add (Peter likes Jill)
&. add (Mary likes Bill)
&. add (Bandersnatch likes Looking-Glass)

Then you can go on to ask questions of your database:

&. which (x: x likes Mary)

and the screen tells you

John
No (more) answers

Sooner or later you'll come up against the royal Tudors and their family affairs - and in the course of this you'll learn how to use a bit more PROLOG:

```
&. add (x grandfather-of y if
        x father-of z &
        z parent-of y)
```

and if you've put the right information in your database, and if you ask the right questions, the screen will light up with answers about the grandchildren of Hen7, the offspring of Bluff-King-Hal, and exactly which sweet young damsels were delivered of which babes.

Later on you might like to try the "expert system" approach to diagnosing faults-in-a-bicycle, find out which capital-cities are north-of London and west-of Beijing, or parse a few English sentences:

```
&. which (x: (the brown cow chews the greeny grass)
              my-sentence x)

(S (NP (DT the) (NE (A brown) (N cow)))
        (VP (V chews)
             (NP (DT the) (NE (A greeny)
                  (N (grass))))))
```

This may not appear terribly helpful out of context, but it prepares the way for personal interrogations which might increase your chances of striking oil next time you sink a shaft. Or, used in conjunction with the STRINGOF primitive (which Ennals introduces as STRING but which doesn't appear at all in the Primer) there are definite possibilities for experimenting with such exotica as machine-assisted language translations.

Oh yes! And if you want to work out prime numbers or n factorial you can do that too; though there's a warning that micro-PROLOG is not necessarily the fastest way of doing it.

In the meantime you may come to love to hate the Spectrum keyboard at its most perverse:

```
&. add (x grandfather jof y if
        x father jof z &
        z parent jof y9
```

and when you wait for more than five minutes while PROLOG and SIMPLE load from cassette, it's no consolation to read Ennals on using CP/M with the B disk as a working disk. In fact, there's no provision for using Microdrive with the Spectrum package - though I'm told it is "extremely likely" to be there "in subsequent versions" - and that's what makes me look forward to a full version on the QL where the larger memory makes more sense of PROLOG's parameters.

If you happen upon the current Spectrum micro-PROLOG, you might like to know:

that you can toggle your ZX printer (but, alas, nothing more imposing) by using TO (i.e. Symbol Shift F) to switch it on and another TO to switch it off again;

that as the screen fills up you can stop it scrolling with a standard Spectrum STOP;

that you can get more room to use SIMTRACE if you
    KILL program-mod
and when you've done your trace
    KILL simtrace-mod
and then reload the missing bits of SIMPLE with
    LOAD PROGRAM

that there's information about graphics and lots, lots more in the micro-PROLOG Reference Manual which should hit the streets any day now .... Hallelujah!

Seriously though: Sinclair's people at Cambridge plus Keith Clark and Richard Ennals have all - like good computer folk everywhere - been very helpful to me in my enquiries and I'm only too glad to be able to acknowledge my indebtedness. Without them these lines could not have been written.

## BOOKS ON THE 68000/68008 PROCESSORS

There seems to be some interest in books about the 68000 and 68008 processors. Here are my recommendations.

68000/68008 hardware is covered in two publications available from any Motorola distributor, such as Celdis, who are on (0734) 585171. These are the 16-bit Microprocessors Data Manual (which also includes the 8-bit peripheral chips) and both volumes of the MCU/MPU Applications Manual. These are around £10 each, I believe. You can obtain data sheets and application notes included in these publications for nothing, but it is probably worth paying for the books, in terms of convenience and easy reference.

68000 Assembly Language Programming by Kane, Hawkins and Leventhal, published by Osborne/McGraw-Hill is recommended for 68000/68008 assembly language programmers. It is an excellent book, if rather expensive at about £17, and seems to have become difficult to obtain, possibly because of the QL. It might also be advisable to get the M68000 16/32-bit Microprocessor Programmer's Reference Manual, fourth edition, written by Motorola, and published by Prentice-Hall at about £15. This should be taken as "the Bible" when you are not sure about anything concerned with the 68000/68008 instruction set. Using this, it might be possible to hand-assemble small Programs, because of the way the op. codes are documented.

Motorola sales offices will give you a Programmers Reference Card for nothing, and I am told that they are also living away cards with a detailed microphotograph of the 68000 chip, and one of the chips itself (just the little piece of silicon) mounted on the card. These are reject devices presumably.

I am in the process of writing a beginners book about the 68000/68008, entitled "Understanding the 68000". This should be available in a couple of months. Please rush out and buy it in enormous quantities!
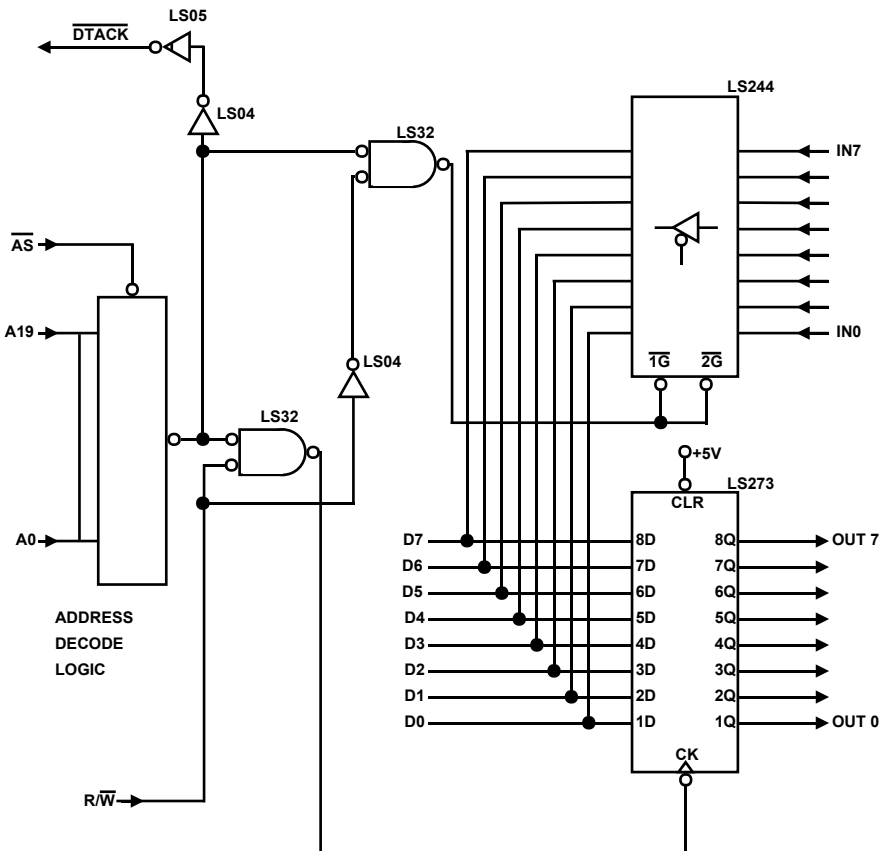

Leon Heller

## SIMPLE INPUT AND OUTPUT PORTS

As promised in the last issue, here is a circuit diagram which shows how an 8-bit input port and an 8-bit output port may be implemented using a few LS TTL chips.

The input port uses an 3-state octal buffer (LS244) and the output port uses an octal D-type flip-flop (LS273). They are enabled by R/$\overline{W}$, in conjunction with the address decode, conditioned by the address strobe signal ($\overline{AS}$), with R/$\overline{W}$ going low when the processor is writing to the output port, and high when the processor is reading from the input port.

I have placed the two I/O devices on the asynchronous 68008 bus, so the circuit has to return $\overline{DTACK}$ to the processor, to instruct it to acquire or transmit the data on the data bus, and terminate the bus cycle. Unlike memory devices, this circuitry can respond much faster than is required by the processor, so no $\overline{DTACK}$ delay is needed, as would be the case if NMOS or CMOS devices were used. $\overline{DTACK}$ is usually pulled up to Vcc by a resistor, and should be returned via an open-collector device (the LSO5), after inversion to make sure it has the correct polarity.

This circuit works satisfactorily on my 68008 system, so I would expect it to work on the QL, with appropriate logic for the address decoding. I seem to remember that the QL should have all the I/O devices in the top 64K of the memory map.

I have just interfaced a 6522 VIA to my 68008 system using the synchronous bus intended for 6800 peripheral devices. The VIA gives me two 8-bit ports with every line Programmable as an input or output, several handshaking signals, two 16-bit counter/timers, and a few other goodies, as well as comprehensive interrupt facilities. This will form a very useful addition to the QL, for a parallel printer, cassette interface, EPROM programmer, D/A and A/D converter, etc. Full details in the next issue.

Leon Heller

## MONITORS FOR THE QL

At the recent Sinclair Educational Users Show, I had a word with Microvitec about monitors for the QL. They have developed one specifically for this purpose, in conjunction with Sinclair, which is even painted black to match the computer. The model is the Cub 653 1451/MQ3, and it has a 14" tube with a 0.43 mm dot pitch. TTL RGB input, of course. The price is £299. They have promised to let me have one to review when I can get hold of a QL.

One of our members, Malcolm Newport, also spoke to them, and suggested that they produce a version with composite video input, also. This would allow the use of the monitor with a VCR, or even another computer, which needs composite video input. The Price will be £325 or so.

Microvitec can be contacted on (0274) 390011.

Leon Heller